

# Change in Practice of using Inhalers for Outpatients have Chronic Obstructive Pulmonary at Nam Dinh General Hospital after Health Education

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**Abstract**— Objectives: To evaluate changes in the practice of using inhalers for outpatients have chronic obstructive pulmonary at Nam Dinh General Hospital after the intervention. To compare the effectiveness between intervention methods of direct consultation (DC) and direct counseling method incorporating information technology (DC – IT). Subject and method: Intervention study on two groups of patients, 30 patients have chronic obstructive pulmonary in each group with similar characteristics who were treated at Nam Dinh General Hospital from October 2019 to May 2020. Two research groups analyzed and compared the practice of patients at two times, the first time (T1) before the intervention and the second time (T2) after the intervention was 3 months with 3 consecutive interventions (each intervention was 1 month). One group intervened with the direct consultation method; one group intervened with the direct counseling method incorporating information technology. Data were collected by the observational method, using the inhaler procedure and entered and processed on SPSS 20.0 software. Results: The group of patients was intervened with the direct counseling method about practice using inhalers increased after the intervention, the average point of inhaler practice before the intervention was  $6.50 \pm 1.63$  and after the intervention was  $8.57 \pm 0.63$  with  $p < 0.05$ . The group of patients who intervened with direct counseling method incorporating information technology about using an inhaler increased after the intervention from  $6.70 \pm 1.29$  (before the intervention) to  $8.80 \pm 0.61$  (after intervention), with  $p < 0.05$ . The efficiency index of using the inhaler dose of (DC – IT) group was higher than the DC group at 63%. Conclusion: The average of the two groups increased significantly after the intervention. However, the intervention method of DC – IT was more effective than the DC method.

**Keywords**— Chronic obstructive pneumonia, use of a dosing inhaler, change in practice.

## I. INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a common respiratory disease that can be prevented and

treated. The disease is characterized by symptoms of persistent breathing and limited airflow, resulting from the airway and / or alveolar abnormalities often caused by exposure to toxic molecules or gases, including tobacco

smoke. Waterpipe tobacco is a major risk factor, and air pollution and smoke are also important risk factors for the disease [2]. COPD ranks third among the causes of death and is one of 10 diseases that cannot be cured globally [13]. An estimated 329 million people suffer from COPD around the world and this number will continue to increase in the coming decades. Because exposure risk factors and the old population are increasing. In Vietnam, the rate of COPD in the population aged 40 and over is 4.2%, with 7.1% male and 1.9% female, it is estimated that about 1.3 million people suffering from COPD need diagnosis and treatment [1]. In the US, COPD is predicted to rank fifth worldwide about the burden of disease and third in mortality by 2020 (M. Molimard, 2014) [12]. COPD has a close relationship with dyspnea, decrease physical capacity, decrease activity and decrease quality of life (GOLD, 2014) [10]. Incorrect use of inhalers is common with COPD. Consequences of poor inhalation technique lead to reduce therapeutic doses, increase the incidence of acute illness, decrease quality of life and increase a burden on the healthcare system. Regular assessment of understanding and reassessment of inhaler using for patients, caregivers and health care professors can significantly improve the benefits of patients from inhalation therapy [5]. According to the study of Francisca Leiva-Fernández (2012), an intervention study on 495 patients diagnosed with COPD, showed that 75% patients used the wrong inhaler technique. After the intervention, reduced to only 17% patients used wrong inhalers technique [11].

According to Adhikari Baral (2019), the patient had the best practice was holding the inhaler horizontally (99.5%), then holding the inhaler vertically (99%) and open the inhaler and remove the empty capsule (97.5%). In contrast, the most incorrect step was breathing in and holding the breath for 10 seconds (4.9%) [4]. Therefore, the interventions will contribute to reduce risk factors, prevent complications, reduce exacerbations, minimize hospitalization and costs, improve patient's quality of life and it is important to reduce the incidence of disease [7].

**Aim of the study:** To assess the current situation and change the patient's practice about using inhaler after the intervention by two methods: direct consultation method (DC) and direct counseling method and incorporating information technology (DC – IT).

**Research subject:** COPD patients were being treated outpatient at Nam Dinh General Hospital.

**Selection criteria:** The patient was diagnosed with COPD, used or was using a dosing inhaler. The patient has able to communicate.

**Exclusion criteria:** The patient did not agree to participate in the study or did not come to the follow-up examination. The patient is unable to cooperate.

## II. METHODS

### *Research setting*

Intervention study on two groups with pre-and post-intervention evaluation at At Nam Dinh General Hospital treated most of the patients with COPD in Nam Dinh province. According to the survey, about 340 patients with COPD receiving outpatient treatment. COPD patients are treated with bronchodilators mainly using a dosed inhaler, using 2-3 times per one patient every day.

### *Measurements:*

Based on the Decision 4562 / QĐ-BYT about the professional document guiding the diagnosis and treatment of chronic obstructive pulmonary disease in Viet Nam (2018) [2] and the 9-step dosing inhaler procedure, each step that patients do correctly was 1 point, wrong or not was 0 point. Satisfactory practice if patients doing right and enough actions, unsatisfactory practice if patients have at least one step was wrong [3].

### *Data collection:*

Data were collected from October 2019 to May 2020

**Sample size:** Collecting in seven months was 60 patients.

**Sample selection method:** Convenient sample selection

60 patients were divided into two random groups: Group one was 30 patients who intervened with the DC method and group two was 30 patients who intervened with DC - IT method.

A checklist for using of the inhaler to observe patients perform the process at a private office in the hospital. The evaluation and intervention were carried out by research members at Nam Dinh University of Nursing.

**Statistical analysis:** The score of each step in the process was added to calculate the total scores, then calculate the average score which a higher score indicates better practice. Using t-test to compare two average scores between before and after the intervention. Collected data were coded and tabulated using a personal computer. Using an SPSS 20.0 program for Windows. Statistical significant was considered at a p-value less than 0.05

### III. RESULTS

Table I. Socio-demographic characteristics of research subjects

Variables		Socio-demographic characteristics					p
		Total	The DC group		The DC – IT group		
		No (Frequency)	No	Frequency	No	Frequency	
Gender	Male	49(81.7)	24	80	25	83.3	> 0.05
	Female	11(18.3)	6	20	5	16.7	
Educational level	Middle school or below	36(60)	18	60	18	60	> 0.05
	High school	9(15)	4	13.3	5	16.7	
	Intermediate or above	15(25)	8	26.7	7	23.3	
Age	Mean±SD	70.45±8.79		70.87±9.21		70.07±8.61	>0.05
	(Min – Max)	(40 - 90)					

Male patients account for a higher proportion than female patients. The average age score of patients was  $70.45 \pm 8.88$ . Patients have a high school education level of about 60%. There were no differences in gender, education level, age between the DC group and the DC – IT group, the differences were not statistically significant with  $p > 0.05$ .

Table II. The practice about using dosed inhaler before the intervention

Variables		Practice about using dose inhaler			p
Practice	Mean±SD	Total	The DC group	The DC-IT group	t= 0.58 > 0.05
	(Min-Max)	6.60±1.74 (4-9)	6.50±1.64	6.70±1.29	

Practice about using dose inhaler between the DC group and the DC-IT group, the difference was not statistically significant with  $p > 0.05$ .

Table III. Changing the practice about using dosed inhaler after the intervention

Practice about using dose inhaler	Mean ± SD		p
	Before the intervention	After the intervention	
The DC Group (n=30)	6.50±1.63	8.57±0.63	t= -7.51; p< 0.05
The DC – IT Group (n=30)	6.70±1.29	8.80±0.61	t= -9.06; p< 0.05

The DC group: The practice about using inhalers increased after the intervention: There was a difference about average score of inhaler practice before the intervention ( $6.50 \pm 1.63$ ) and after the intervention ( $8.57 \pm 0.63$ ), the difference was statistically significant with  $p < 0.05$ .

The DC-IT group: The practice about using inhaler increased after the intervention DC-IT method: There was a difference about average score of inhaler practice before the intervention ( $6.70 \pm 1.29$ ) and after the intervention card ( $8.80 \pm 0.61$ ), the difference was statistically significant with  $p < 0.05$ .

Table IV. Compare the effectiveness of the two methods of the intervention between before and after the intervention

Practice about using of dose inhaler	The DC group			The DC -IT group		
	Before	After	Intervention effect index	Before	After	Intervention effect index
	No (%)	No (%)		No (%)	No (%)	
Satisfactory	4(13.3)	19(63.3)	375.9	5(16.7)	27(90)	438.9
Unsatisfactory	26(86.7)	11(36.7)		25(83.3)	3(10)	

The effect of DC-IT method was higher than the DC method with the intervention effect index at 438,9 and 375,9 respectively (effectiveness of the intervention was 63%).

#### IV. DISCUSSION

Changing practice about using dose inhaler of COPD patients:

The DC method: Practice about using dose inhaler before and after intervention were 13.3% and 63.3% respectively. There was a difference in the average scores before the intervention  $6.50 \pm 1.63$  and after the intervention  $8.57 \pm 0.63$ , the difference was statistically significant with  $p < 0.05$ .

The DC-IT method: Practice using an inhaler dose increased from 16.7% to 90%. There was a difference in the average score before the intervention ( $6.70 \pm 1.29$ ) and after the intervention ( $8.80 \pm 0.61$ ), the difference was statistically significant with  $p < 0.05$ . Health education (DC method and DC-IT method) are effective. Therefore, it is important to help patients improve the practice of using the inhaler. This result was similar to the study of author Nguyen Duc Tho (2016) that health education was effective [3]. Before the intervention, no patients had good practices and most of the patients did not know the above practices. After the intervention, the effect was significantly increased, using the aerosol dose was correct from 10.1% to 74.8%, a significant difference with  $p < 0.001$ . However, the results of this study were higher than the study of Nguyen Duc Tho. Because the intervention method of studies was different, the study of Nguyen Duc Tho was carried out in the community, patients who did not discover the disease and didn't know about using the inhaler. While this study was performed on patients who were diagnosed and had been treated in the hospital. Many studies about the effectiveness of health education and educational interventions for patients also achieve different effects depending on the intervention form. Folch (2017) showed that after education for patients with COPD, the number of patients hospitalized decreased by 58.8%, give up smoking

accounted for 77.8%; using inhalers was the correct technique accounted for 100% [8]. Clare Gardiner (2010), the provision of palliative care services for COPD patients is very necessary. Besides, health education and training for medical professors and continue research to achieve the best care services for patients [6]. According to author Fotokian Z and et al (2017): The most important factor to improve the practice of using inhalers was the provision of instructions about inhaler using technique. Therefore, medical staffs need to supplement verbal instructions about inhaling dry powder to improve knowledge and practice for patients with COPD [9].

Compare the effectiveness of two methods after intervention: The study performed on 60 patients with COPD, the research subjects divided into two random groups and each group has 30 patients. There were no differences in sex, education level, disease duration, age, the practice of using dose inhalers between the two intervention groups, the difference not statistically significant with  $p > 0.05$ . The effectiveness index of using dose inhaler of DC-IT group was higher than the DC group with intervention effect was 63%. Therefore, the DC – IT method intervention was more effective. Because when COPD patients receive health education, they will watch the videos as a form of reviewing knowledge and skills to use the inhaler and discovering their mistakes. This is a method of direct health education and counseling go with using Audio-visual devices (video - computer) which have illustrations and complement speech were suitable for all subjects, anywhere. Therefore, this method has many advantages to improve practices for patients. In practice, COPD disease have long-term treatment under the guidance of doctors, routine examination and treatment management are very necessary for preventing complication and improve the quality of life for the patients. The role of doctors and the

regular relationship between doctors and patients play an important role in the prevention of COPD disease [3].

Research limitations: Due to the limited time, economy and resources, the research only conducted an intervention study about using dose inhalers in two groups: DC group and DC – IT group with small sample size and no representation for the entire population. Another hand, the research topic focuses on health education and counseling intervention for COPD patients with no mentions of related factors to practices about using dosing inhalers.

## V. CONCLUSIONS

Changing practice of using inhalers after intervention.

DC method: There was a difference in average score about practice using dose inhaler before intervention ( $6.50 \pm 1.63$ ) and after intervention ( $8.57 \pm 0.63$ ). The difference was statistically significant with  $p < 0.05$ .

DC - IT method: There was a difference in average score about practice using dose inhaler before intervention ( $6.70 \pm 1.29$ ) and after intervention ( $8.80 \pm 0.61$ ). The difference was statistically significant with  $p < 0.05$ .

Comparing the intervention effectiveness of DC method and DC – IT method: The effectiveness index of using dose inhaler of DC-IT group was higher than the DC group with intervention effect was 63%.

## VI. RECOMMENDATIONS

Based on the study results, the following recommendations are suggested:

This study recommends instructions about practice of using dose inhalers for COPD patients by DC method and DC – IT method to improve practice of using dose inhalers. Maintaining health education for all COPD patients was necessary. Enhance the role and responsibility of medical staffs in the process of guiding practice of using inhalers for patients with COPD in the hospital and at home. Medical staffs should guide and supervise COPD patients about using dose inhaler in order to maintain effectiveness and compliance using inhaler.

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